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<p>(21) International Application Number: PCT/KR99/00441 (22) International Filing Date: 9 August 1999 (09.08.99) (30) Priority Data: 1998/32388 10 August 1998 (10.08.98) KR (71) Applicant (for all designated States except US): YUHAN-KIMBERLY LTD. [KR/KR]; 942 Daechi 3-dong, Kangnam-ku, Seoul 135-725 (KR). (72) Inventors; and (75) Inventors/Applicants (for US only): KIM, Doo-Hong [KR/KR]; LG Apartment #1127-1303, Sanbon-dong, Kunpo-shi, Kyunggi-do 435-040 (KR). KIM, Hyung-Bum [KR/KR]; 278-4 Bisan-dong, Dongan-ku, Anyang-shi, Kyunggi-do 431-050 (KR). HWANG, Eo-Yeon [KR/KR]; 652-9 Naeson-dong, Uwang-shi, Kyunggi-do 437-080 (KR). KANG, Eun-Jung [KR/KR]; 441-85 Bon-dong, Dongjack-ku, Seoul 156-060 (KR). (74) Agent: LEE, Kuiy, Dong; Seoul Building, 114-31, Uni-dong, Chongro-ku, Seoul 110-350 (KR).</p>		<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report.</p>
<p>(54) Title: ELASTIC-SIDED ABSORBENT PAD WITH SOFT, COMFORTABLE SIDE PANELS</p> <div data-bbox="533 1531 1478 1749" data-label="Image"> </div> <p>(57) Abstract</p> <p>An elastic sided curved absorbent pad is provided with soft side edges providing efficient leakage protection without irritation. The pad (1) has elasticized side panels (6) which comprise at least two layers (16) of non-woven material mounted between a cover (2) and baffle (5), projecting beyond the side edges of the cover and the baffle, giving the panel soft, free outer distal edges (7) and one or more elastic members (10) in board of the free distal edge (7). The layers of non-woven material and the elastic member are bonded together, except for the distal edges which are not bonded. This provides a lace-like appearance and feel.</p>		

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## ELASTIC-SIDED ABSORBENT PAD WITH SOFT, COMFORTABLE SIDE PANELS

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### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates to an absorbent pad, such as a feminine pad, sometimes  
10 called a sanitary napkin, and an adult incontinence pad. More specifically, this  
invention relates to an absorbent pad which has elasticized side panels which comprise  
at least two layers of non-woven material mounted between a cover and a baffle, said  
elasticized side panels projecting beyond side edges of the cover and the baffle giving  
the panel free outer distal edges. The layers of non-woven material are bonded  
15 together by at least one elastic member positioned inboard of the free distal edge but  
the distal edges are not bonded to provide lace-like appearance and feeling.

#### 2. Description of the Prior Art

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In most absorbent pads, such as feminine pads and incontinence pads  
manufactured today, side edges of feminine pads are closer to the fluid discharge area  
than are the distal edges and the pads tend to leak at the side edges rather than at the  
distal ends. It is common for body fluid deposited onto the cover to form a pool  
25 before it penetrates down through the fluid-permeable cover and into the absorbent.  
Side leakage occurs when the deposited body fluid pools on the cover material and  
is allowed to spread along the surface of the cover before being absorbed  
into the absorbent.

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Attempts have been made to reduce side leakage by providing side panels or  
flaps extending outwardly from and along the side edges of the pad. European Patent  
Application 0,534,488 A1 to Menard relates to a pad with elasticized side panels.  
But, the flaps include a member which wraps around the distal edges of the side  
panels. Such member may be flange or loop.

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PCT WO 93/10733 to Tailor discloses a pad with elasticized side panels which

are formed by Z-folding of the back sheet and the top sheet material extending outward from the side edges of the pad.

U.S. Patent 5,542,941 to Morita discloses a pad with elasticized side panels including a loop of material which encloses a flap of material extending laterally outward from the edge of the absorbent core.

U.S. Patents 5,234,422 and 5,308,346 to Sneller disclose a sanitary napkin with elasticized side flaps. But the elastic members associated with the side flaps are folded about the distal edge of the side panel such that a portion of the elastic member is secured to the outer surface of the side panel and another portion is secured to the inner surface of the side panel. In another embodiments of the Sneller patent, the elastic members are laterally extended outwardly beyond the distal edges of the side flap. The elastic members disclosed therein comprise an elastomeric laminate such as the tri-laminate comprising a coverstock layer, a second coverstock layer and an elastomeric layer, such as an elastomeric film, positioned between and operatively associated with the coverstock layers. The laminated elastic member of the side flaps does not provide sufficient softness or comfort thereby incurring skin irritation in the wearer's crotch portion.

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Other patents, which teach various aspects of this invention, include the following: U.S. Patent No. 5,397,318 to Dreier, U.S. Patent Nos. 4,770,657 and 4,701,177 to Ellis et al., U.S. Patent Nos. 5,171,302 and 4,397,645 to Buell, U.S. Patent Nos. 5,032,121, and 4,944,735 to Mokry, U.S. Patent No. 4,938,757 to Van Gompel et al., U.S. Patent No. 4,655,759 to Romans-Hess, U.S. Patent No. 5,074,856 to Coe et al., and European Patent Applications 0 590 675 and 0 595 047 to Van Gompel et al.

The foregoing elastic-sided pads have a curved shape which prevents side leakage of body fluid and conforms to the curved shape of a human torso, but the stiff side edges cause discomfort during use. Through the present invention, a comfortable sanitary napkin having soft side edges but efficient leakage protection is Provided.

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#### SUMMARY OF THE INVENTION

Briefly, this invention relates to a curved and elastic-sided absorbent pad, such as a feminine pad sometimes called a sanitary napkin and an adult incontinence pad, having exceptionally soft and aesthetically pleasing side panels. The elasticized side panels have lace-like soft edges and bias the pad into a curved configuration when unfolded. The side panels include at least two layers of a non-woven material preferably mounted between the extended cover and baffle, and the distal edges of the layers extend outward beyond the side edges of the cover and the baffle. Elastics are provided on the non-woven materials, but they are positioned inboard of the outer distal edges and the layers are not bonded together at their free edges to provide soft, comfortable and non-irritating edges.

The general objective of this invention is to provide a comfortable pad which has soft side edges but provides efficient leakage protection. It is achieved by making the free distal edge of the elasticized side panel substantially less stiff than those of the prior art elastic-sided pads which have a composite laminate of the cover, baffle and elastic member which present a stiff and sharp edge along the edge of the pad occurred by adhesive or thermal bonding of laminated layers, by mechanical cutting at the side edge of the bonded composite laminate, and by shirring of cutting edges with elasticity. In other prior art which uses elastic laminate composed of a cover and/or baffle without having any separate nonwoven, the shirred cover and/or baffle with elasticity also presents a stiff and sharp edge due to the natural properties of the densified cover and/or baffle material. Therefore, in the present invention, free distal edges of the cover and baffle composite are also made in the same configuration as with the elasticized side panel, by bonding the cover and baffle composite at the side edges except at the free distal edges to provide soft side edges.

Another object of this invention is to provide an absorbent pad which is less irritating to the skin and therefore is more comfortable.

A further object of this invention is to provide an absorbent pad which comfortably fits the curved body shape, providing efficient leakage and making the pad less noticeable when worn under tight-fitting clothing.

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#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective cut-away view of the absorbent pad having lace-like elasticized side panels.

5        FIG. 2 is a cross-sectional view of the pad cut at the concave center and having two embossed lines.

FIG. 3 is a top plan view of the pad showing the bodyside cover.

10       FIG. 4 is a bottom side plan view of the pad showing the baffle.

FIG. 5 is a top or bodyside plan view of the pad of an alternate embodiment.

15       FIG. 6 is a top or bodyside plan view of a pad having wings.

#### DETAILED DESCRIPTION OF THE INVENTION

Referring to FIGS. 1 and 2 an absorbent pad (1), such as a feminine pad or  
20 adult incontinence pad is shown which is designed to be worn by a female or adult to absorb body fluids such as menses, blood, urine, and other excrements discharged during the menstrual period. The pad (1) has a liquid-permeable cover (2) having a bodyside surface (3), an absorbent core (4), a breathable plastic baffle (5) and shirred or gathered elasticized side panels (6) having at least two layers (16) of a non-woven  
25 material mounted between the cover (2) and the baffle (5), and the outer distal edges (7) of the layers (16) project at least 1 millimeter beyond the side edges (8, 9) of the cover and the baffle. Elastic members (10) are positioned on or between the non-woven layers (16), but inboard of the outer distal edges (7) of the side panels (6).

30       The liquid-permeable cover (2) is made of a laminated apertured film/non-woven fabric, apertured film only, or non-woven fabric only. The composite of an apertured film and a through air bonded carded nonwoven web is bonded together by the point-to-point bonding process in the desired pattern, the process for which is described in European Patent Application EP 0 596 532 to  
35 Alikhan. The cover (2) is preferably 20 grams per square meter (gsm) and can be air permeable.

The cover material may be aligned with the side edges (9) of the baffle (5) providing non-bonded soft free distal edges. This is achieved by bonding the side edges of a corresponding size of the cover (2) and the baffle (5) except at the distal edges. The side edges (8, 9) of the cover (2) and the baffle (5) are bonded, except for  
5 a portion no less than 0.5 millimeters from the very end of the side edges which are not bonded together, thereby forming free distal edges. No mechanical cutting is made at the side edges after bonding.

Alternatively, the cover material may be folded along the side edges of the  
10 baffle toward the bodyside surface (3) as shown in FIG. 5. The folded portion (20) of the cover material is bonded to the facing portion of the cover by point-heat sealing or adhesive, except at the very distal end (21) of the side edges. In this alternate embodiment, the side edges (8, 9) of the cover (2) and the baffle (5) are also bonded, except for a portion no less than 0.5 millimeters from the very end (21) of the side  
15 edges which are not bonded together, thereby forming free distal edges. The non-bonded distal ends (21) provide a cushioning effect and a neat appearance.

The liquid-permeable cover (2) can also contain a plurality of apertures formed therein and the apertures may be arranged along the longitudinal center line, if  
20 desired. The apertures will increase the rate at which body fluids can penetrate down into the absorbent core (4). The cover (2) may also be treated with a surfactant to increase its hydrophilic properties. The surfactant may consist of topical additions or internally applied materials such as polysiloxanes.

25 The moisture-impervious baffle (5) is generally vapor and air-permeable while blocking the passage of body fluids and liquids. The baffle (5) is preferably formed of polyethylene film-laminated non-woven materials which gives touching like natural textile. The baffle is preferably about 45 grams per square meter, dimple embossing-processed, and has a water vapor transfer rate (WVTR) of approximately  
30 1,000 to 4,000 gram per cubic centimeter per day. The baffle (5) may contain a filler and may be stretched to achieve better vapor permeability.

The cover (2) and the baffle (5) are preferably of approximately rectangular shape, not of an hourglass shape, and may extend beyond the side edges (22) of the  
35 hour-glass shaped absorbent core (4).

The absorbent core (4) may be secured to the baffle by an adhesive or, alternatively, it may be enclosed by a liquid permeable cover. The absorbent core (4) is preferably of an hourglass shape. Preferably, the absorbent core extends across at least about 50% of the pad, preferably about 75%, more preferably essentially across the entire length of the pad and terminates at the end seal lines (23). The absorbent core (4) has the capability of absorbing essentially the entire amount of body fluid deposited onto the pad. The absorbent core can be composed of traditional fluff, coform, air-laid tissue, uncreped through air-dried toweling, staple fibers, conventional tissue and the like. Preferably, the fluff has no embossing pattern. Superabsorbents are also very good at retaining body fluids, absorbing a great amount of fluid in relation to their own weight. Typical superabsorbents used in feminine pads may be employed.

The elastic side panel or side elastic (6) is elastically composed of polypropylene/polyethylene non-woven material. The non-woven material is preferably hydrophobic and more than 15 grams per square meter preferably of through air bonded carded web. To prevent irritation which may occur from lamination, the non-woven material has low fiber density, less than 0.036 gram per cubic centimeter, preferably less than 0.018 gram per cubic centimeter. Preferably, the side panels comprise at least two layers of non-woven material of low fiber density and at least one elastic member which is positioned inboard of the distal free edge. In particular, preferably, the non-woven layers and the elastic member are bonded together by an adhesive, except for the portion no less than 0.5 millimeters from the very end of the distal edges (7) of the side panels (6) which are not bonded. At least one elastic member or strand (10) is positioned on or between the layers of non-woven carrier sheet material (16), thereby forming a loosely laminated lace of a certain elasticity and size.

The loosely-laminated, elastic lace can be made of through air bonded carded web/Lycra (trademark of E. I. du Pont de Nemours and Company) filaments/through air bonded carded web or nonwoven/elastic threads/nonwoven, etc. Preferably, the elastic strand (10) is made of Lycra filaments and has about 560 to 840 denier thickness. It usually has a tension of about 120% to 200% based on unstretched length. Elastic members (10) tensioned and preferably positioned separately from the absorbent core (4) provide better standing of the side panels (6) for side leakage protection with the hourglass-shaped core (4).



Preferably, the bodyside surface (3) of the pad has two arcuate embossed lines (11) (also called as channels, side stoppers or fluff fasteners). The embossed lines (11) increase the density of the absorbent core (4) and increase the pad's resistance to bunching and cover swell during use. They also prevent side leakage as a dam.

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Optionally, a surge or acquisition layer (13) can be positioned between the cover (2) and the absorbent core (4) to prevent rewetting and reinforce absorbency. The surge layer (13) is made of non-woven material composed of polyester fiber and bicomponent polypropylene/polyethylene fiber or can be airlaid, through air bonded  
10 carded web or thermal bonded carded web. It is usually of a rectangular shape and the surge is bonded with the cover, preferably by a honeycomb pattern.

An integrity tissue (14) is optionally positioned between the absorbent core (4) and the acquisition layer (13). The integrity tissue (14) is placed to maintain the  
15 constrained state of the absorbent core (4), that is, to prevent separation or coagulation. The integrity tissue is preferably of an hourglass shape, about 35 gram per square meter (gsm) and can be air-laid or fluff.

The pad (1) is preferably of an hour-glass shape having a wide end radius,  
20 thereby preventing end leakage and providing a more stable and closer contact with the body line. It also may further include wings (18) preferably of a tab shape, as shown in FIG. 6. The portion of the wings which bonds to the baffle (5) is positioned between the side panel (6) and the baffle (5) or on the baffle.

25 In a preferred embodiment of a pad (1) for a normal amount of menstruation, the pad is about 220 millimeters to about 250 millimeters long and about 100 millimeters wide. The absorbent core (4) is about 230 mm long and about 65 to 85 mm wide. The surge (or acquisition layer, 13) is about 55 mm wide and 230 mm long. The integrity tissue (14) is about 130 mm long. The side panel (6) is about  
30 160 mm and 150% stretched.

The cover (2) and the baffle (5) are bonded together at the sides preferably by point-heat sealing (24) with adhesive and at the ends by patterned-heat sealing (23). Alternatively, the cover (2) and baffles (5) are bonded by peripheral two-line heat  
35 sealing with adhesive to provide a neat, clean treatment without irritation.

Referring to FIGS. 2 and 4, the adhesive (17) to hold the garment in place may be placed upon the baffle (5) in any desired arrangement including a series of narrow strips. Generally, the preferred arrangement is with the adhesive formed in one strip. A peel strip (19) covers the adhesive (17), which preferably has a total width of between about 1 and about 1 1/2 inches (2.54 to 3.81 centimeters) and a length of about 4 to 6 inches (10.16 to 15.24 centimeters) . The adhesives (17) may include hot-melt adhesives. The garment adhesive may also have three lines of paper tapes or peel strips (19) having a length of 210 mm, a width of 10 mm and weighing 0.32 grams. Lines of adhesives (17) are preferably spaced 9.5 mm apart from each other.

Example 1

A feminine pad for a heavy menstruation period preferably has the following configuration:

		length	width	weight	bulk	shape
		(mm)	(mm)	(g)	(mm)	
20	fluff	254	65 (c) 80 (e)	8.43	6.5	hourglass
	cover	282	100	0.54		
	surge	210	65 (c)	0.41		
	rectangular					
	baffle	282	98	1.20		
25	integrity	254	65 (c) 80 (e)	0.65		hourglass
	tissue					
	elasticized side panels (see example 2)					
	garment	210	10 (each)	0.32		
	adhesive			50.7 gsm		
30	peel strip	230	55	0.76		
	finished pad	282	110	12.99	7	

Example 2

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In the pad of example 1, the elasticized side panels, preferably of Lycra

laminates, have the following structure:

	Lycra laminate	
	length (relaxed)	135 mm
5	length (under tension)	150 mm
	width / side	12 mm
	Lycra strand / side	3

wherein, the Lycra strand has the following structure:

10	length (relaxed)	135 mm
	stretch after lamination	125%
	weight (both sides)	0.07 g

15 and the layer of nonwoven material has the following structure:

	length	168 mm
	width / side	12 mm
	weight (both sides)	0.039 g

20

While the invention has been described in conjunction with several specific embodiments, it is to be understood that many alternatives, modifications and variations will be apparent to those skilled in the art in light of the foregoing description. Accordingly, this invention is intended to embrace all such alternatives, modifications and variations which fall within the spirit and scope of the appended claims.

**What Is Claimed Is:**

1. An elastic-sided absorbent pad having a curved configuration when unfolded and a longitudinal axis, comprising:
  - 5 a) a liquid-permeable cover having a bodyside surface, an absorbent core-side surface, distal ends and side edges;
  - b) a liquid-impermeable baffle having an absorbent coreside surface,  
10 garment-side surface, distal ends and side edges, wherein the side edges of said cover and said baffle are bonded except for a portion no less than 0.5 millimeters from the very end of the side edges thereby forming free distal edges;
  - c) an absorbent core positioned between the cover and the baffle, said  
15 absorbent core having a pair of side edges;
  - d) a pair of shirred elasticized side panels, each operatively positioned between the cover and the baffle, extending outwardly from and along each side edge of said absorbent core and projecting at least 1 mm beyond the side edges of the cover and  
20 the baffle thereby having a free distal edge, said elasticized side panel comprising at least two layers of non-woven material of low fiber density of less than 0.036 gram per cubic centimeter and at least one elastic member which is positioned inboard of the distal free edge, wherein said non-woven layers and said elastic member are bonded together, except for a portion no less than 0.5 millimeters from the very end  
25 of said free distal edges which are not bonded.
2. The elastic-sided absorbent pad of Claim 1 wherein said non-woven material of said elasticized side panels has density of less than 0.018 gram per cubic  
30 centimeter.
3. The elastic-sided absorbent pad of Claim 1 or 2 wherein each of said elasticized side panels is elastically composed of polypropylene/polyethylene non-woven material.
- 35 4. The elastic-sided absorbent pad of Claim 1 or 2 wherein each of said elasticized side panels is made of hydrophobic non-woven material and is more than

15 gram per square meter for a layer.

5. The elastic-side absorbent pad of Claim 1 or 2 wherein said elastic member has a tension of about 120% to 200% based on unstretched length.

5

6. The elastic-sided absorbent pad of Claim 1 or 2 wherein said bodyside surface of the cover has at least two lines of channel embossing.

7. The elastic-sided absorbent pad of Claim 1 or 2 further comprising a rectangular-shaped surge made of non-woven material positioned between the cover and the absorbent core.

10

8. The elastic-sided absorbent pad of Claim 1 or 2 further comprising an hourglass-shaped integrity tissue positioned between the absorbent core and the surge.

15

9. The elastic-sided absorbent pad of Claim 1 wherein the cover is aligned with the side edges of said baffle by bonding the side edges of a corresponding size of the cover and the baffle except at the distal edges.

10. The elastic-sided absorbent pad of Claim 1 wherein the cover is folded along the side edges of said baffle toward the bodyside surface and the folded portion of the cover is bonded to the facing portion of the cover, except at the very distal end of the side edges.

20

11. The elastic-sided absorbent pad of Claim 1 wherein the absorbent core is of an hourglass shape and the cover and the baffle extend out of the side edges of the absorbent core.

25

12. The elastic-sided absorbent pad of Claim 1 wherein the pad further comprises three lines of garment adhesives formed longitudinal to the pad.

30

13. The elastic-sided absorbent pad of Claim 1 wherein the pad further comprises a wing of a tab shape.

1/3

Fig. 1

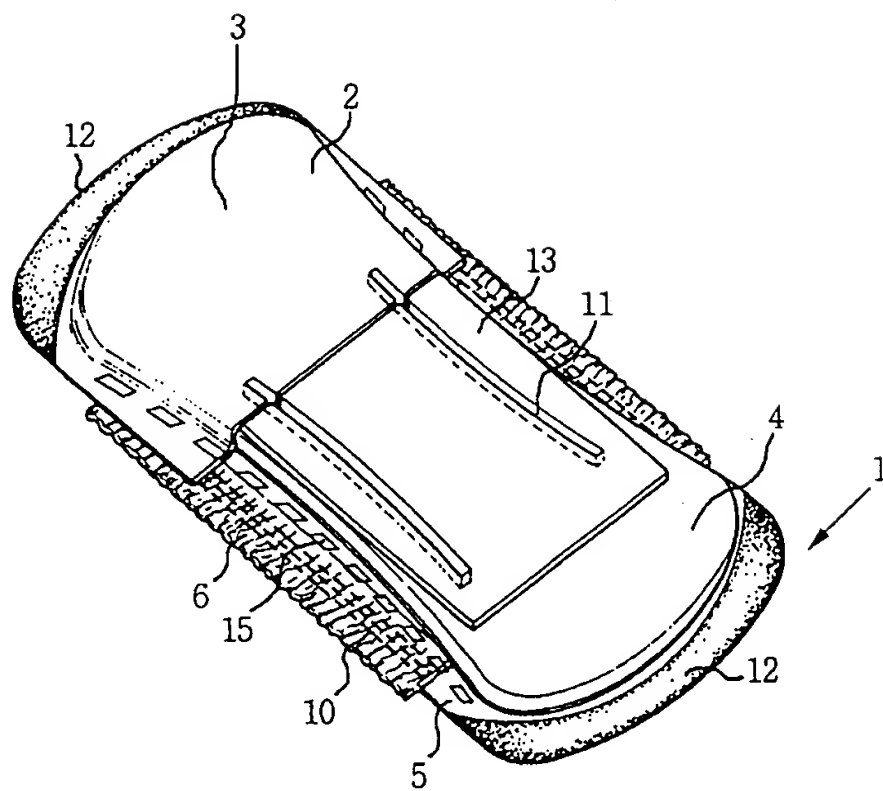


Fig. 2

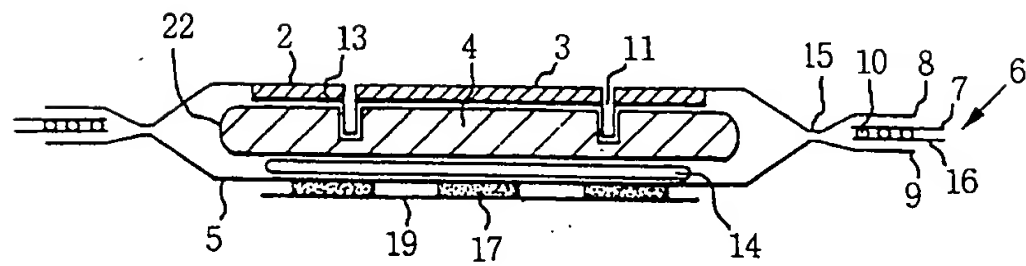


Fig. 3

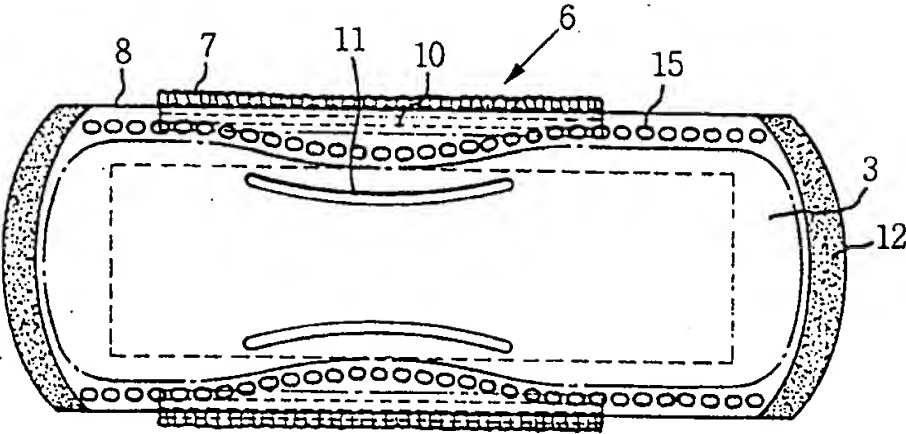


Fig. 4

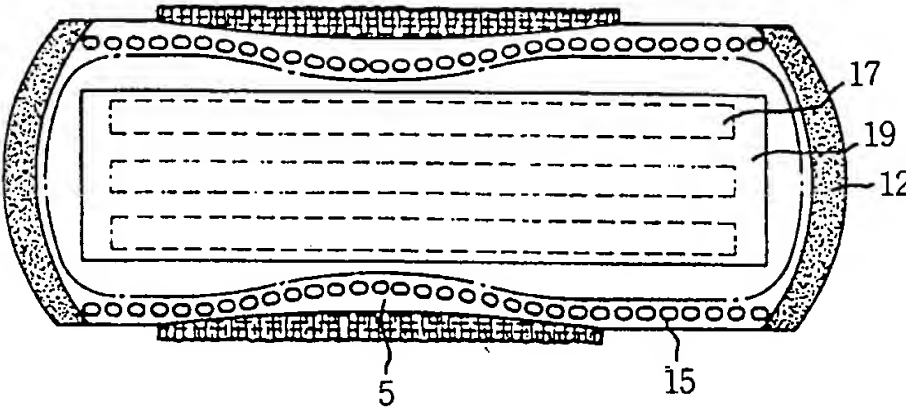


Fig. 5

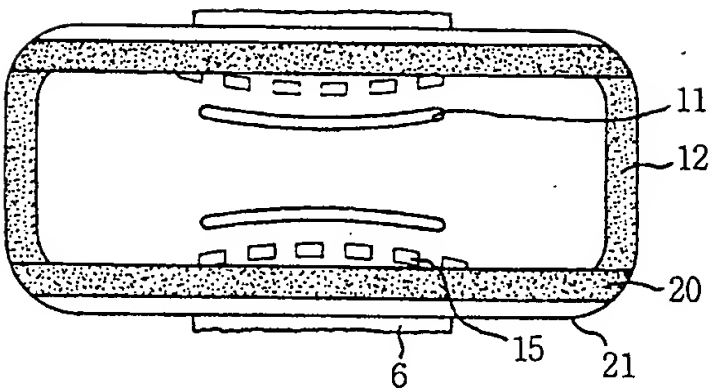
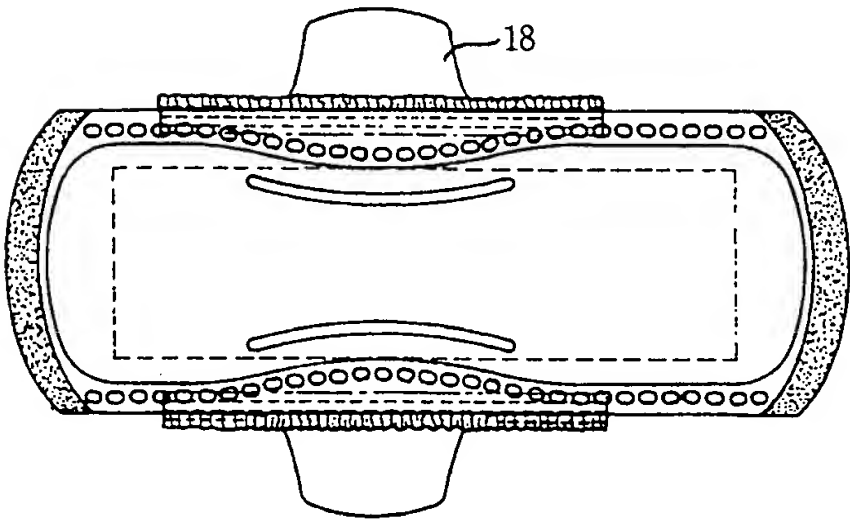


Fig. 6





# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/KR 99/00441

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>																						
Int Cl <sup>6</sup> : A61F 13/15																						
According to International Patent Classification (IPC) or to both national classification and IPC																						
<b>B. FIELDS SEARCHED</b>																						
Minimum documentation searched (classification system followed by classification symbols) IPC: A61F 13/15																						
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU IPC: A61F 13/15																						
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) DERWENT, JAPIO: soft, free, lace like, ruffle smock gather frill shirt																						
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>																						
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																				
Y	WO 91/18573 A (THE PROCTER AND GAMBLE COMPANY) 12 December 1991 page 3 line 31 to page 4 line 17; figures 3 and 7.																					
Y	US 4857067 A (WOOD et.al.) 15 August 1989 column 4 line 62 to column 5 line 17, figure 5.																					
A	US 5074856 A (COE et.al.) 24 December 1991 column 3 lines 42 to 61.																					
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<p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>"A"</td> <td>Document defining the general state of the art which is not considered to be of particular relevance</td> <td>"T"</td> <td>later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"E"</td> <td>earlier application or patent but published on or after the international filing date</td> <td>"X"</td> <td>document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"L"</td> <td>document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"Y"</td> <td>document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"O"</td> <td>document referring to an oral disclosure, use, exhibition or other means</td> <td>"&amp;"</td> <td>document member of the same patent family</td> </tr> <tr> <td>"P"</td> <td>document published prior to the international filing date but later than the priority date claimed</td> <td></td> <td></td> </tr> </table>			"A"	Document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E"	earlier application or patent but published on or after the international filing date	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family	"P"	document published prior to the international filing date but later than the priority date claimed		
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Date of the actual completion of the international search 19 October 1999		Date of mailing of the international search report - 2 NOV 1999																				
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No.: (02) 6285 3929		Authorized officer  <b>MATTHEW FORWARD</b> Telephone No.: (02) 6283 2606																				

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/KR 99/00441

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report				Patent Family Member			
WO	91/18573	AU	80874/91	BR	9106509	CN	1056997
		EP	532600				
US	4857067	BR	8806376	CA	1311334	EP	323040
		IN	171994	JP	1168902		
US	5074856	US	4701177				